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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/538,507

06/09/2005

Fumio Kuriyama

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EXAMINER

MENDEZ, ZULMARIAM

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

06/10/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/538,507	<b>Applicant(s)</b> KURIYAMA ET AL.	
	<b>Examiner</b> ZULMARIAM MENDEZ	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 22,23,25,30-33 and 35-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22,23,25,30,31 and 35-43 is/are allowed.
- 6) ☐ Claim(s) 32 and 33 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

1. Figures 27-30 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

2. Claim 25 is objected to because of the following informalities: claim 25 currently depends upon claim 24 which has been previously cancelled by the applicant. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakaki et al. (US Patent no. 6,875,333) in view of McHugh et al. (US Patent application no. 2005/0006241).

With regard to claims 32 and 33, Sakaki discloses a plating apparatus (col. 1, lines 7-8) comprising: a plating tank (10) for holding a plating solution (col. 7, lines 21-24); and a stirring mechanism (40, figure 1) having a plurality of solid stirring vanes (41,80; figures 1, 3 and 7), the stirring vanes (41, 80) being arranged at respective positions (vane 41 is located at a higher position with respect to vane 80 – as shown in figure 7), both vanes facing the surface of the workpiece (W) and immersed in the plating solution in the plating tank for stirring the plating solution at different regions (col. 10, lines 1-22); wherein the stirring vane (41) comprises a plurality of stirring vanes which are actuatable by respective independent drive mechanisms (col. 2, lines 37-40; col. 11, lines 52-54; col. 12, lines 41-53), but fails to teach wherein the stirring vanes have irregularities on at least one side thereof, the irregularities comprising a succession of triangular or rectangular sawtooth irregularities.

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McHugh teaches paddles and enclosures for processing workpieces (abstract) wherein the paddles (441a-441g; figures 4A-4G) may have irregularities of different shapes, such as diamond and rectangular-shaped (page 3, paragraph 29) in order to reduce or eliminate electrical shadowing effects created at the surface of the workpiece during electrochemical processing (abstract; page 3, paragraphs 27 and 29).

Therefore, one having ordinary skill in the art would have found it obvious to modify the shape of the paddles, as taught by McHugh, in the apparatus of Sakaki, in order to reduce or eliminate electrical shadowing effects created at the surface of the workpiece during electrochemical processing.

In addition, it is noted that the limitation of "...for generating swirls in the plating solution when the stirring vane is reciprocally moved..." has not been given patentable weight because it has been held that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997)

### ***Allowable Subject Matter***

6. Claims 22, 23, 25, 30, 31, and 35-43 are allowed.
7. The following is an examiner's statement of reasons for allowance:

With regard to independent claim 22, the prior art made of record fails to teach or suggest a fixing plate having an opening therein arranged so as to divide an interior of a plating tank into an anode compartment accommodating the anode and a workpiece compartment accommodating the workpiece and a ring shaped nozzle pipe being fixed

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to the fixing plate. There was found a teaching in the prior art teaching modification suggesting modification of the conventional electroplating apparatus in order to obtain the features of the present invention.

With regard to independent claim 35, the prior art made of record fails to teach wherein stirring vanes extend vertically within the plating tank, the vanes having respective tip ends which are aligned with each other in such a way that the distance between the stirring surfaces of the stirring vanes and the substrate are equal. There was found a teaching in the prior art teaching modification suggesting modification of the conventional electroplating apparatus in order to obtain the features of the present invention.

With regard to independent claim 38, the claimed invention requires a plating apparatus comprising a plating tank for holding a plating solution, a stirring mechanism having a stirring vane for immersing in the plating solution and facing the workpiece surface, the stirring vane being mounted on a rotational shaft and reciprocally moveable parallel to the surface of the workpiece wherein the vane is oriented such that a plane of the stirring vane forms an angle, and varies the angle with respect to a plane perpendicular to the surface of the workpiece, as the stirring vane reciprocally moves by angular movement of the rotational shaft about the longitudinal axis of the rotational shaft.

The closest Prior Art discloses a plating apparatus comprising a plating tank for holding a plating solution; and a stirring mechanism having a stirring vane immersed in the plating solution in the plating tank wherein the stirring vane comprises a plurality of

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stirring vanes and disposed in a position facing a surface to be plated of a work piece the stirring vane being reciprocally movable parallel to the surface to be plated of the workpiece to stir the plating solution; wherein the stirring vane is operable to form an angle with respect to the surface the work piece which is variable as the stirring vane reciprocally moves but fails to teach wherein such stirring vane forms an angle with respect to a plane perpendicular to the surface of the workpiece and wherein such angle varies by an angular movement of the rotational shaft about the longitudinal axis of the rotational shaft. There was no teaching in the Prior Art suggesting modification of the conventional apparatus to obtain the stirring mechanism of the present invention.

8. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Response to Arguments***

9. Applicant's arguments with respect to claim 32 have been considered but are moot in view of the new ground(s) of rejection. Applicant argues that the Prior Art of record fails to teach "...a plurality of solid stirring vanes being arranged at respective positions facing the surface of the workpiece...; each vane being moveable within a region different from regions of the other stirring vanes...", as amended. However, upon further consideration, a new ground of rejection has been presented above.

10. Applicant's arguments, see Remarks filed on March 1, 2010, with respect to claims 22 have been fully considered and are persuasive. The applicant argues that the

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Prior Art of record fails to teach a ring shaped nozzle pipe fixed to a fixing plate having an opening therein, the fixing plate being arranged so as to divide an interior of the plating tank into an anode compartment accommodating the anode and a workpiece compartment, as amended. Therefore, the previous rejection has been withdrawn.

11. Applicant's arguments, see Remarks filed on March 1, 2010, with respect to claims 35 have been fully considered and are persuasive. The applicant argues that the Prior Art of record fails to teach a plurality of stirring vanes extending vertically within the plating tank wherein respective end tips of the vanes are aligned with each other such that distances between the stirring surfaces of the stirring vanes and the surface of the substrate are equal, as amended. Therefore, the previous rejection has been withdrawn.

### ***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

13. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of



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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZULMARIAM MENDEZ whose telephone number is (571)272-9805. The examiner can normally be reached on Tuesday-Friday from 9am to 7pm.

15. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D Wilkins, III/  
Primary Examiner, Art Unit 1795

/Z. M./  
Examiner, Art Unit 1795